

Algebra 2

Linear Functions Word Problems

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Suggested directions:

Make a table or graph or sequence to describe each problem. Then write an equation and solve the problem.

The cost of producing 4 cartons is \$204.80. The cost of producing 8 cartons is \$209.60. How much does it cost to produce 20 cartons?

$$\begin{array}{r} 209.60 \\ - 204.80 \\ \hline 4.80 \end{array}$$

$$m = \frac{4.80}{4} \text{ slope}$$

$$m = 1.20 \text{ per carton}$$

$(4, 204.80) \quad (8, 209.60) \quad (\text{Cartons, \$})$   
 $y = 1.20x + 200$  1. Rule 2 Equation 3 Formula  
 $x = 20 \quad y = 1.20(20) + 200$   
 $y = 24.00 + 200$   
 $y = 224$

There were 174 words typed in 3 minutes. There were 348 words typed in 6 minutes. How many words will be typed in 8 minutes?

$(\text{min, words}) \quad (3, 174) \quad (6, 348) \quad (8, ?) = (8, 464)$   

$$\text{slope } m = \frac{348 - 174}{6 - 3} = \frac{174}{3} = 58$$

1. Rule  
2. Equation  
3. Formula  $y = 58x$   
 $y = 58(8) = 464 \text{ words typed in 8 minutes}$   
 $(8, ?)$

After 5 months the number of subscribers to a newspaper was 5730. After 7 months the number of subscribers to the newspaper was 6022. How many subscribers to the newspaper will there be after 10 months?

$(\text{month, subscribers}) \quad (5, 5730) \quad (7, 6022) \quad (10, ?)$   

$$\text{slope } m = \frac{6022 - 5730}{7 - 5} = \frac{292}{2} = 146 \text{ subscribers per month}$$

1. Rule  
2. Equation  
3. Formula  $y = 146x + 5000$   
 $y = 146(10) + 5000 = 60460 \text{ subscribers after 10 months}$   
 $(10, ?)$

A pump removes 1000 gallons of water from a pool at a constant rate of 50 gal/min. After how many minutes will the pool be empty?

$(\text{minutes, gallons}) \quad m = -50$   
 initially 1000 gallons  $\text{slope} = -50 \frac{\text{gal}}{\text{min}}$   
 $y = \# \text{ of gallons}$   
 Pool will be empty when  $y = 0$   
 $0 = -50x + 1000$   
 $50x = 1000$   
 $x = 20$  the tank will be empty in 20 minutes  
1. Rule  
2. Equation  
3. Formula  $y = -50x + 1000$

# Algebra 2

## Linear Functions Word Problems

There are 2 leaves along 3 in. of an ivy vine. There are 14 leaves along 15 of the same vine. How many leaves are there along 6 inches of the vine?

$$\boxed{\text{(incher, leaves)}} = (x, y) \quad (3, 2) \text{ \& } (15, 14) \quad m = \frac{14-2}{15-3} = \frac{12}{12} = 1$$

$$y = 1x + b \quad y = x - 1$$

$$(6, ?) \quad y = 6 - 1 = 5 \quad (6, 5) \text{ 5 leaves}$$

A 2-mile cab ride costs \$5.25. a 5-mile cab ride costs \$10.50. how much does a 3.8 mile cab ride cost?

$$\boxed{\text{(miler, cost)}} = (x, y) \quad (2, 5.25) \text{ \& } (5, 10.50)$$

$$m = \frac{10.50 - 5.25}{5 - 2} = \frac{5.25}{3} = 1.75 \quad y = 1.75x + b$$

$$y = 1.75x + 1.75$$

$$(3.8, ?) \quad y = 1.75(3.8) + 1.75 = \$6.65$$

There are 55 blades of grass in 1 square inch of lawn. There are 230 blades of grass in 4 square inches of lawn. How many blades of grass are in 3 square inches of lawn?

$$\boxed{\text{(square inch, blades)}} \quad (1, 55) \text{ \& } (4, 230) \quad (3, ?)$$

$$m = \frac{230 - 55}{4 - 1} = \frac{175}{3} = 58\frac{1}{3} \quad y = 58\frac{1}{3}x + b \quad y = \frac{175}{3}x + 3\frac{1}{3}$$

$$x = 3 \text{ square inch} \quad y = \frac{175}{3}(3) + 3\frac{1}{3} = 175 + 3\frac{1}{3} = 178\frac{1}{3} \approx 178 \text{ blades}$$

### CHALLENGE!

~~Refer to the chart on the whiteboard. According to that chart, is your number of tardies to school greater or less than what we would expect? DEFEND your answer using math.~~